

DESCRIPTIONS OF TWO NEW SPECIES OF TORTOISES
FROM THE TERTIARY OF THE UNITED STATES.

By O. P. HAY.

The species first to be described was collected by Mr. Charles Schuchert, assistant curator, division of stratigraphic paleontology, U. S. National Museum. The specimen was found in the *Zeuglodon* beds of the Jackson formation of the Eocene, in Choctaw County, Alabama, near Cocoa post-office, on land belonging to Mr. James Brown. In the immediate vicinity, Mr. Schuchert collected also a nearly complete skeleton of *Basilosaurus* (*Zeuglodon*), some bones of *Dorudon*, and vertebræ of the snake which has been described and figured by Mr. F. A. Lucas¹ as *Pterosphenus schucherti*.

The turtle was found lying imbedded in the rock with the plastron downward. The upper portion of the carapace had been planed off by denudation down to the upper borders of the marginals. It is therefore impossible to determine the character of the neural and costal bones and of the various superior epidermal scutes. The remainder of the shell was intact, or nearly so, when excavated; but, in spite of careful packing, it suffered much in shipment to the National Museum. However, notwithstanding its broken condition, it has, under the intelligent supervision of Mr. Lucas, the Curator of the Division of Comparative Anatomy, been so skillfully restored that little is left to be desired, so far as the plastron and most of the marginals are concerned. To Mr. Lucas I am indebted for the opportunity to study and describe this interesting relic.

I have assigned this species provisionally to the genus *Hadrianus* of Cope. It undoubtedly belongs there, or to *Testudo*, or to some closely related genus. In order to determine this question definitely we need to have the upper portion of the shell. An examination of the diagram of the shell of *Testudo ibera* given by Boulenger² shows that the neurals and costals of this genus have undergone peculiar modifications. The neurals are alternately quadrate and octagonal, while the outer ends

¹ Proc. U. S. Nat. Mus., 1898, XXI, p. 637.

² Catalogue of Chelonians, p. 151.

of the costals are alternately very wide and very narrow. In *Hadrianus* the elements of the carapace have not attained such differentiation.

The species here described is named in honor of its discoverer. It will therefore be known as

HADRIANUS SCHUCHERTI.

The total length of the shell of this tortoise was originally close to 75 cm. (30 inches); its width, 52.5 cm. (21 inches). As will be seen from an inspection of Plate IV, the lateral borders of the shell are nearly straight, and parallel with each other. In front of the forelegs the margins round rapidly into the anterior border, so that in front the carapace is quite truncate. The hinder border approaches a segment of a circle. Neither the anterior nor the posterior margin is to any degree serrated.

The marginals rise on the side of the carapace to a height of 10 cm. The passage from the lower surface of the shell to the upper is quite abrupt; but this is due to a considerable extent, at least, to distortion from pressure. In living forms of *Testudo* the upper portion of the shell usually rounds gradually into the lower portion.

The borders of the carapace over the openings for the posterior limbs are gently reverted; over the openings for the lower limbs the carapace is somewhat more strongly reverted. The caudal marginal appears to have descended without any upward flare.

The plastron is concave; it has a length of 67.5 cm. On a line 25 mm. in front of the axillary notch the width of the anterior lobe of the plastron is 28 cm. The tip of the lobe is prolonged into an obtuse angle. The tip is considerably thickened in front, but the borders are rather acute. The tip of the lobe was not prolonged in front of the carapace. In *Hadrianus octonarius*, the type of the genus, the plastron ends in front in a very broad and truncate lip.

The width of the bridge is slightly more than one-third the length of the plastron. Measured on a line 25 mm. behind the inguinal notches, the width of the hinder lobe of the plastron is 30 cm. This lobe is deeply notched on its hinder border. The posterior angles may, however, have been somewhat more rounded than in the restoration.

The entoplastron has a width of 15 cm. Its hinder border can not be accurately traced, but its position was not greatly different from that represented by the dotted line on Plate V. The other bony elements of the plastron have their boundaries shown on the same plate by means of the continuous zigzag lines. They present no essential variations in form or position from those of modern species of *Testudo*.

The conformation of the epidermal scutes, whose sutures are shown by the stippled lines in Plate V, is not, so far as can be determined with certainty, essentially different from that of the shields of recent species of *Testudo*. The gulars did not encroach on the territory of the entoplastron. The humero-pectoral suture runs straight across the plastron until it approaches the axillary notch, when it turns abruptly forward.

The pectoral shields are extremely narrow in the middle line, but they widen right and left. The suture between the right and the left abdominal shields is very long, being contained in the length of the plastron only two and one-half times. There is present on each side an evident inguinal shield, and there were probably axillary shields, but they can not be demonstrated. I am not able to determine with certainty the position of the suture between the marginal shields and those of the plastron. In *Testudo* and its immediate allies this suture is well up on the marginal bones. In other genera, as *Geomyda* and *Clemmys*, it is located near the outer border of the plastral bones. In *H. schucherti* the suture between the pectorals and the abdominals gives off, near the outer border of the hyoplastron, what seems plainly to be a branch which is directed forward. This branch seems to me to be the anterior end of the suture between the plastral and the marginal shields. If such it is, it is quite different in position from that of species of *Testudo*. In the type of *Hadrianus*, a large and quite perfect shell, the sutures between the epidermal shields are very deep and distinct, but the sutures between the bones are usually very obscure. Nevertheless, I believe that here too the epidermal suture referred to lies on the plastral bones.

The second species of turtle to be described comes from coal-bearing strata of Miocene age. The particular locality is mine No. 4, near Roslyn, Washington. This town is located in Kittitass County, at the eastern base of the Cascade range of mountains. The deposit in which the turtle was found is known as the Roslyn sandstone. The preservation of the fine specimen is due to the intelligent interest of Mr. P. Y. Heckman, of Roslyn, from whom it was obtained for the U. S. National Museum. The Museum is indebted to Dr. F. H. Knowlton for his friendly offices in securing this species.

The specimen displays only the upper surface of the shell; but this is almost entire and almost uninjured. It is probable that the plastron is also present, but the matrix is so refractory that it has been thought best not to attempt to remove it. After a careful study of the carapace I have been unable to assign it to any of the described genera of Testudines. I therefore venture to propose a new genus for its reception. The specific name I derive from the collector of the specimen. The name of this new form is

ACHERONTEMYS HECKMANI.

Generic characters.—Carapace broad, rather depressed. Neural bones about as broad as long; mostly hexagonal, with the antero-lateral sides much shorter than the postero lateral. A single very broad pygal. Marginals 23 in number, coinciding with the outer ends of the costals, instead of alternating with them. Vertebral shields very broad.

Name derived from *Acheron*, a river of the fabled lower world, and *emys*, a turtle.

Specific characters.—Carapace broad, rounded in front and behind.

No evidences of serrations on the border behind. Median line apparently occupied by a keel of low bosses.

Surface of the carapace mostly smooth, with the impressions of the shield sutures distinct; areas occupied by costal shields with some longitudinal wrinkles. First neural nearly square; the eighth pentagonal, with the anterior side very short. The single pygal extremely broad, extending across three marginals. The nuchal is considerably broader than long. Marginals quadrate; the lateral ones each placed opposite the end of a costal. The second and third vertebral shields enormous, extending laterally beyond the middle of the costals, the anterior border of the second vertebral occupying its usual position. Its hinder border thrown back to the hinder border of the third neural. The hinder border of the third vertebral not crossing the fifth neural, the usual position, but thrown backward to near the hinder border of the sixth neural. The fourth neural is thus made very concave in front. Costal shields narrow, not one-half as wide as the contiguous vertebrals, alternate sutures between lateral marginal shields coinciding with sutures of costal shields.

As to the relationships of this genus we can say nothing certain until we have at least had an opportunity to study the plastron. Nevertheless its affinities appear to be with the Chelydridæ, and we may place it there provisionally. It is of interest to compare the figure on Plate VI with the diagrams of the carapaces of *Chelydra* and *Macroclermys*, found in Boulenger's Catalogue of Chelonians.¹ The carapaces of all three genera have the same general form; in all, the neural bones are closely similar; in all, the marginals lie opposite the outer ends of the costals, instead of alternating with the latter. In *Chelydra* and *Macroclermys*, however, there are more or less extensive fontanelles between the costals and marginals. In both, the vertebral shields are of moderate width; in both, the hinder border of the shell is serrated. Length of the carapace, 181 mm; its width, 118 mm.

Certain described genera of fossil turtles display vertebral shields as broad, perhaps, as those of the form here described. Among these may be mentioned *Hylaechelys*, which is figured by Dr. Lydekker.² In this genus, however, the neural bones are long and narrow. *Plesiochelys*, a figure of which may be found in Zittel's Handbuch, page 545, also has very broad vertebral shields; but here again the neurals are narrow. *Platycheles*³ is also furnished with broad vertebrals, but it is in many respects different from *Acherontemys*. The neurals are very irregular in form and size; the carapace has a different form and is covered with large bosses.

It is to be hoped that Mr. Heckman will be able, through the miners in his employ, to secure other specimens of this species, so that the structure of the plastron may be determined.

¹ Pages 22, 25.

² Catalogue of the fossil Reptilia and Amphibia, Pt. 3, p. 188, fig. 43.

³ Lydekker, Catalogue of the fossil Reptilia and Amphibia, Pt. 3, p. 217, fig. 48; Zittel, Handbuch, III, p. 533, fig. 499.